

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions of the claims.

1 – 54. (Cancelled)

55. (Currently amended) A microfluidic system comprising:

- a) at least one measurement chamber, wherein the measurement chamber comprises walls and a base;
- b) at least one hollow nanotip protruding from the walls or base of the measurement chamber and having an aperture at an end of the nanotip; and
- c) at least one microchannel connected to ~~in communication with~~ the measurement chamber, the microchannel having at least one inlet positioned to receive an aqueous solution and at least one outlet positioned to deliver the aqueous solution into the measurement chamber.

56. (Previously presented) The microfluidic system of claim 55, wherein at least one of the measurement chambers is circular.

57. (Previously presented) The microfluidic system of claim 55, wherein the nanotip lumen comprises a conducting medium.

58. (Previously presented) The microfluidic system of claim 57, wherein the conducting medium is a liquid conducting medium.

59. (Previously presented) The microfluidic system of claim 58, wherein the liquid conducting medium comprises an electrolyte solution, or an electrically conducting polymer.

60. (Previously presented) A microfluidic system comprising

- a) at least one measurement chamber comprising walls and a base;
- b) a plurality of electrode tips, wherein the electrode tips protrude from the walls or base of the measurement chamber; and

c) at least one microchannel in communication with the measurement chamber, wherein the microchannel comprises at least one inlet position to receive an aqueous solution and at least one outlet positioned to deliver the aqueous solution into the measurement chamber.

61. (Previously presented) The system of claim 55 or 60, wherein the at least one tip is tapered to facilitate insertion into a cell or cell structure.

62. (Previously presented) The system of claim 55 or 60, wherein at least one tip comprises a contacting surface for contacting biological molecules or macromolecules and wherein the contacting surface comprises a hydrophilic material.

63. (Cancelled)

64. (Currently amended) The system of claim 62, wherein the at least one contacting surface has ~~comprises~~ a diameter of less than ~~about~~ 5 μm .

65. (Currently amended) The system of claim 62, wherein the at least one contacting surface has ~~comprises~~ a diameter of less than ~~about~~ 1 μm .

66. (Cancelled)

67. (Currently amended) The system of claim 55 or 60, further comprising a pressure control device in fluid communication with at least one microchannel, for controlling positive and negative fluid pressure ~~applied to~~ at least one microchannel.

68 – 70. (Cancelled)

71. (Currently amended) The system of claim 55 or 60, wherein the microchannel in the microfluidic system is interfaced to in fluid communication with a multiwell plate through one or more external tubings or capillaries.

72 – 82. (Cancelled)

83. (Currently amended) The system of claim 55 or 60, further comprising an amplifier connected to in communication with the at least one nanotip electrode.

84 – 88. (Cancelled)

89. (Previously presented) The system of claim 55 or 60, further comprising a plurality of buffer delivery and agonist delivery channels, each channel comprising an outlet for delivering a substantially separate aqueous stream into the chamber.

90. (Cancelled)

91. (Previously presented) The system of claim 55 or 60, wherein at least one microchannel delivers at least one agent into the measurement chamber.

92 – 103. (Cancelled)

104. (Previously presented) The system of claim 55, wherein the at least one tip protrudes extends from a substantially planar portion of the measurement chamber.

105. (Previously presented) The system of claim 60, wherein the plurality of tips protrude from a substantially planar portion of the measurement chamber.

106. (Cancelled)